

# KIC 009083564

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009083564-01	OBS	3249.01	0.918364	131.616666	12.8	3.020	11.8	8.2	1.43	6210	0.61	7520.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009083564-01	OBS	FP	0.00	0	1	0	1	MOD_SEC_ALT—CENT_CROWDED—EPHEM_MATCH

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

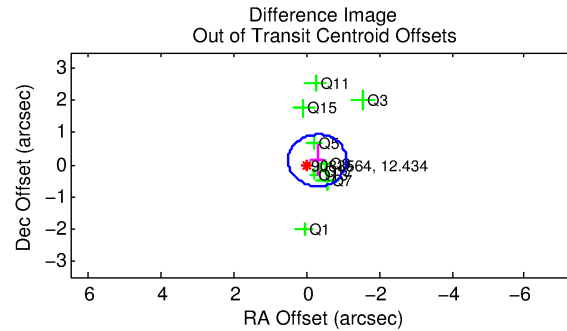
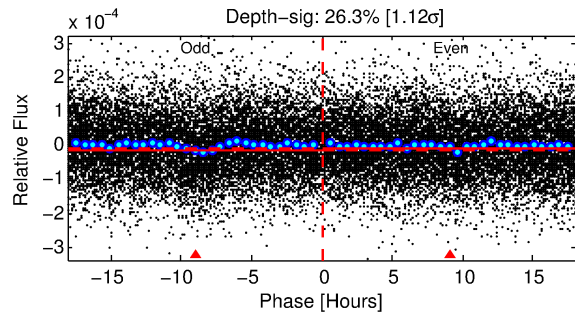
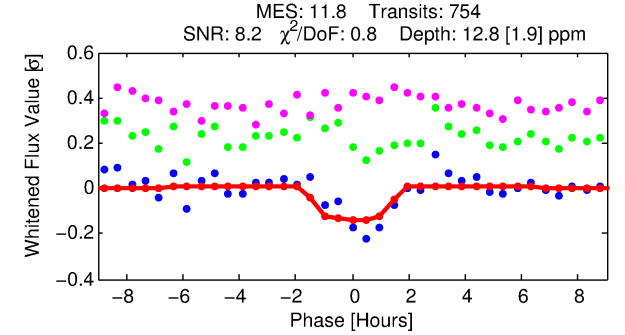
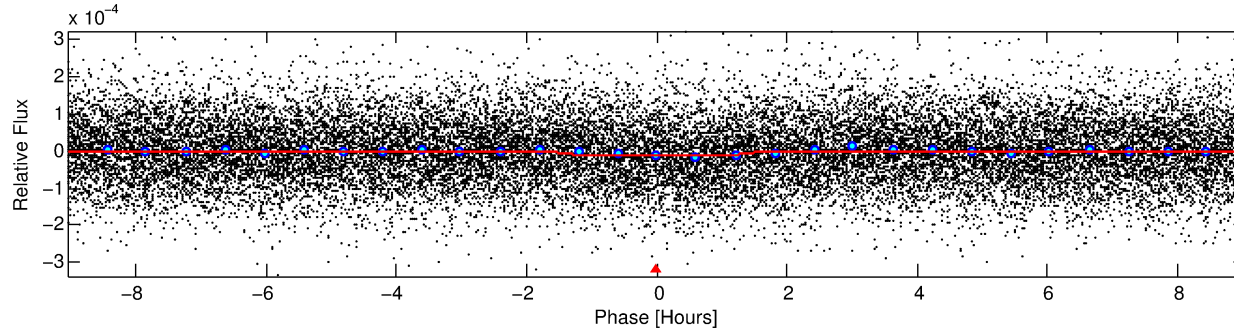
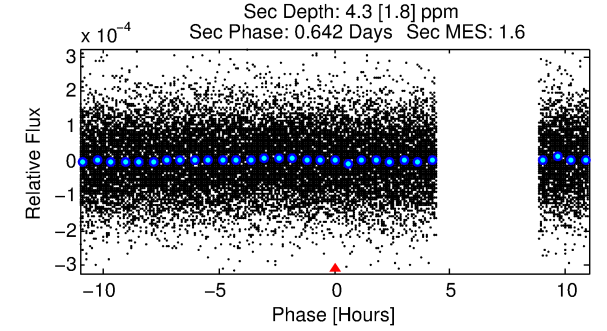
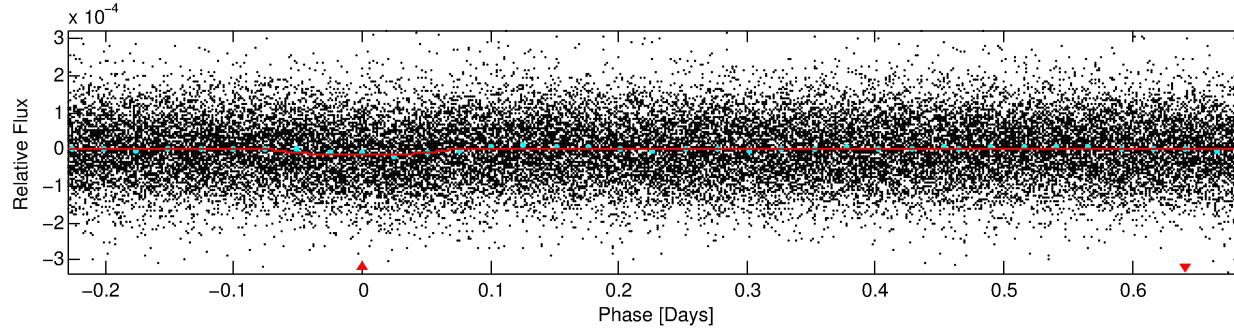
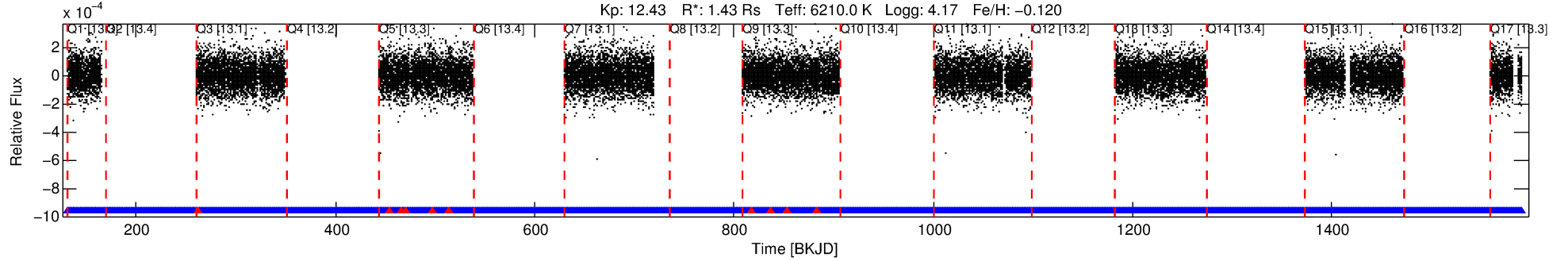
## Ephemeris Match Information For 009083564-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
009083564-01	9083564	4731.01	9083470	1:1	113.5	28	2	15.90	12.44	14.92	Direct-PRF	1	4.49	1.07

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 9083564 Candidate: 1 of 1 Period: 0.918 d  
KOI: K03249.01 Corr: 0.803



## DV Fit Results:

Period = 0.91836 [0.00001] d  
Epoch = 131.6167 [0.0044] BKJD  
Rp/R\* = 0.0039 [0.0016]  
a/R\* = 1.34 [1.33]  
b = 0.92 [0.39]  
Seff = 7520.96 [2756.56]  
Teq = 2375 [218] K  
Rp = 0.61 [0.28] Re  
a = 0.0191 [0.0040] AU  
Ag = 2.29 [2.21] [0.58σ]  
Teffp = 4516 [1037] K [2.02σ]

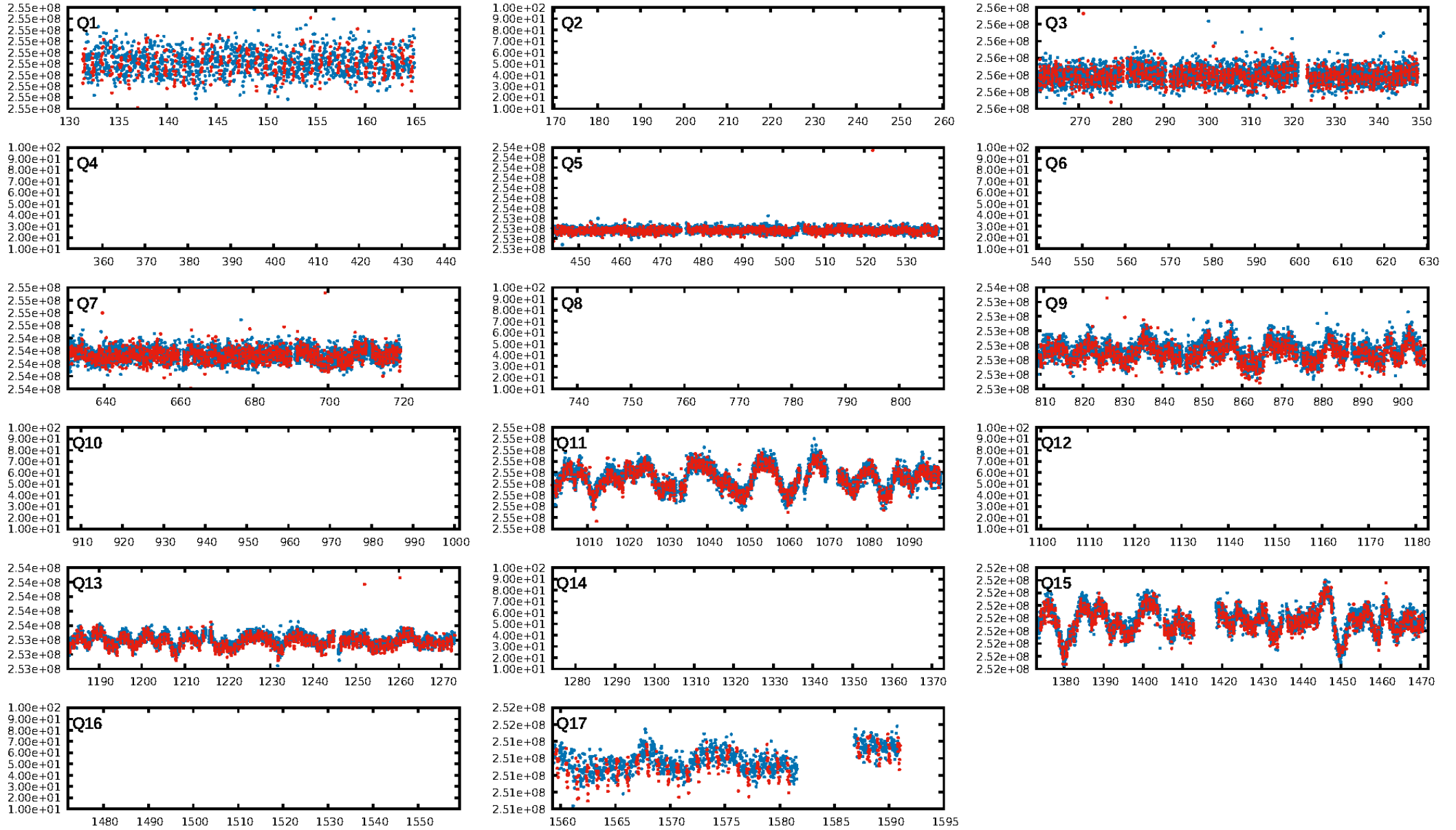
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.91e-29  
RollingBand-fgt: 0.99 [678/688]  
**GhostDiagnostic-chr: 0.7577**  
Centroid-sig: 0.0%  
Centroid-so: 7.468 arcsec [4.80σ]  
OotOffset-rm: 0.326 arcsec [1.21σ]  
OotOffset-st: 0/4/0/5 [9]  
KicOffset-rm: 0.226 arcsec [0.59σ]  
KicOffset-st: 0/4/0/5 [9]  
DiffImageQuality-fgm: 0.67 [6/9]  
DiffImageOverlap-fno: 1.00 [9/9]

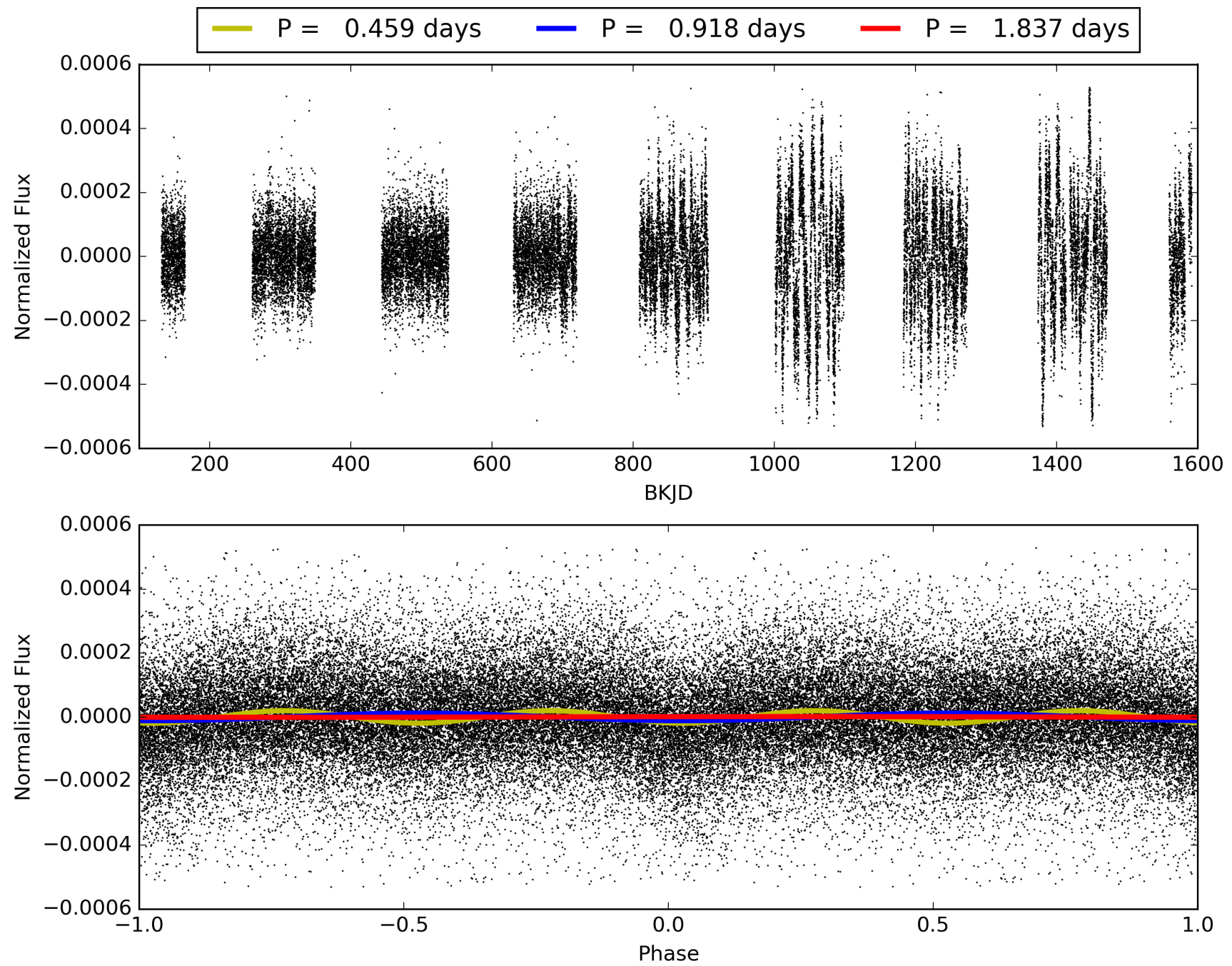
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:44:58 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009083564-01, PDC Light Curves

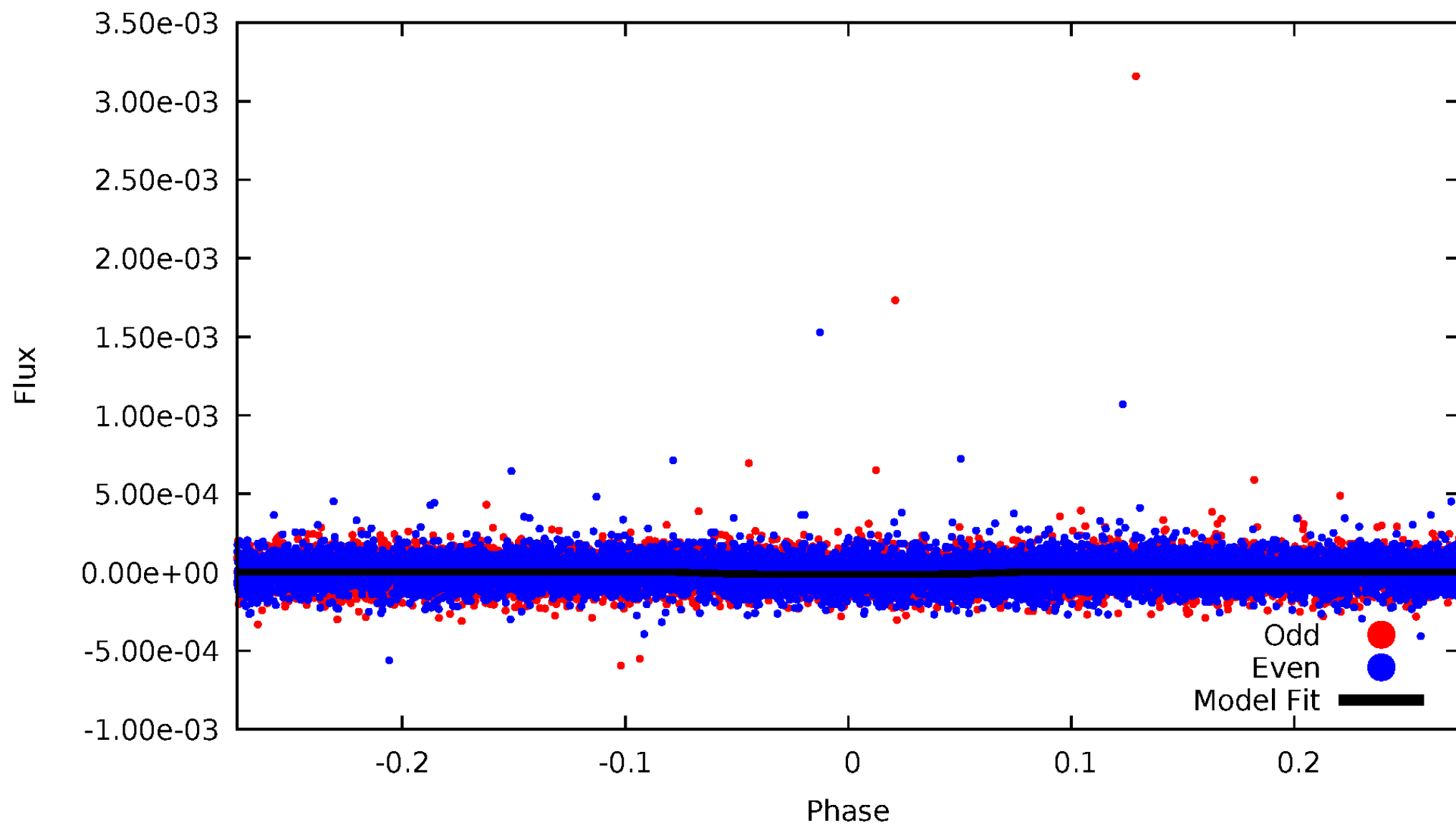


TCE 009083564-01



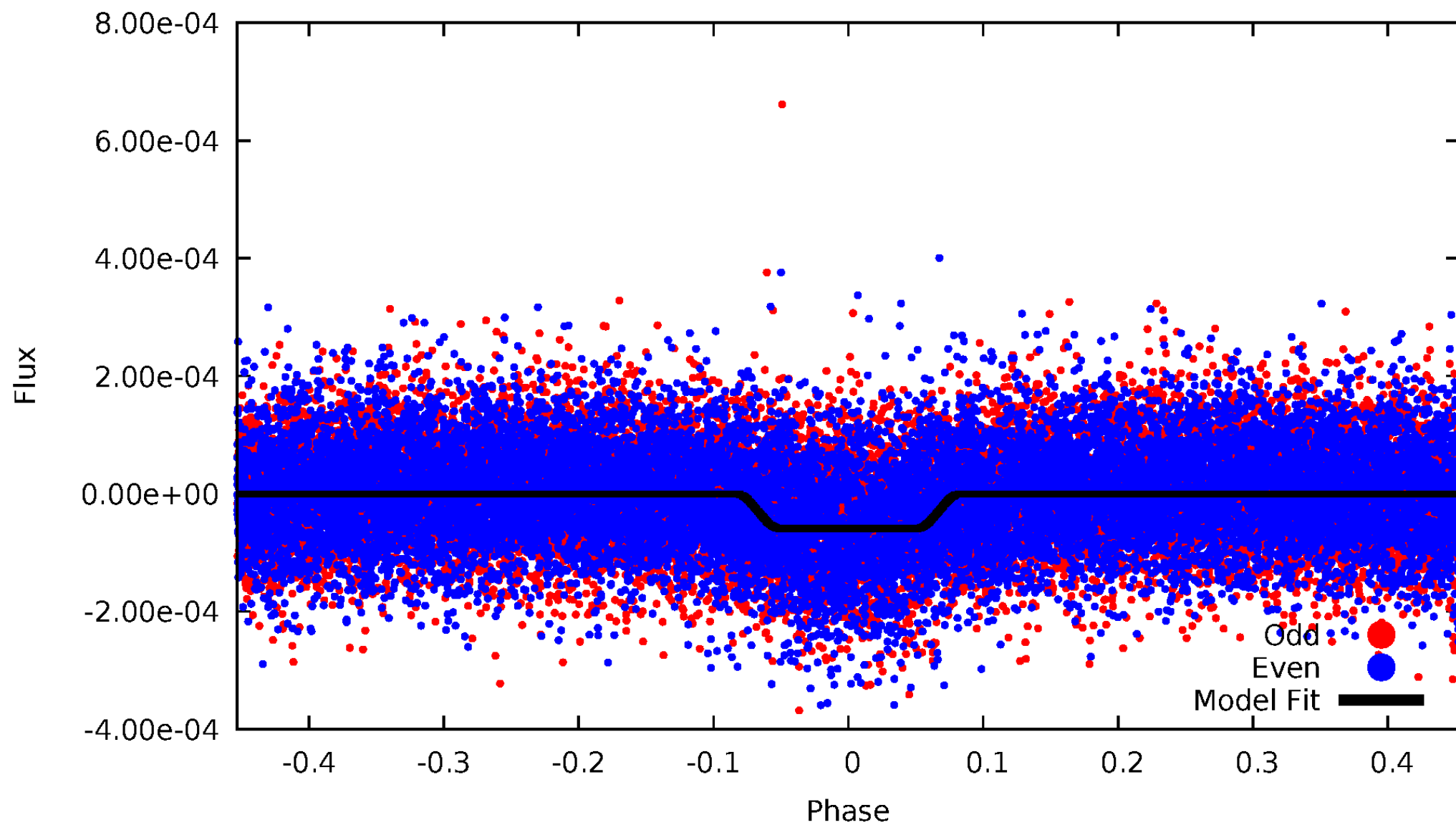
# DV Odd/Even

TCE 009083564-01



# ALT Odd/Even

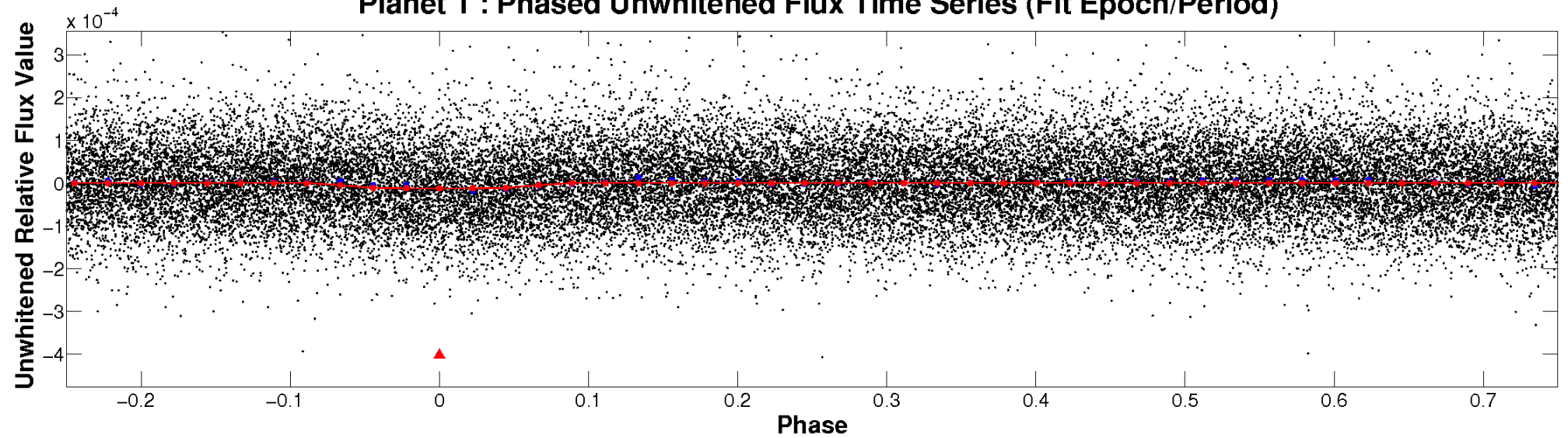
TCE 009083564-01



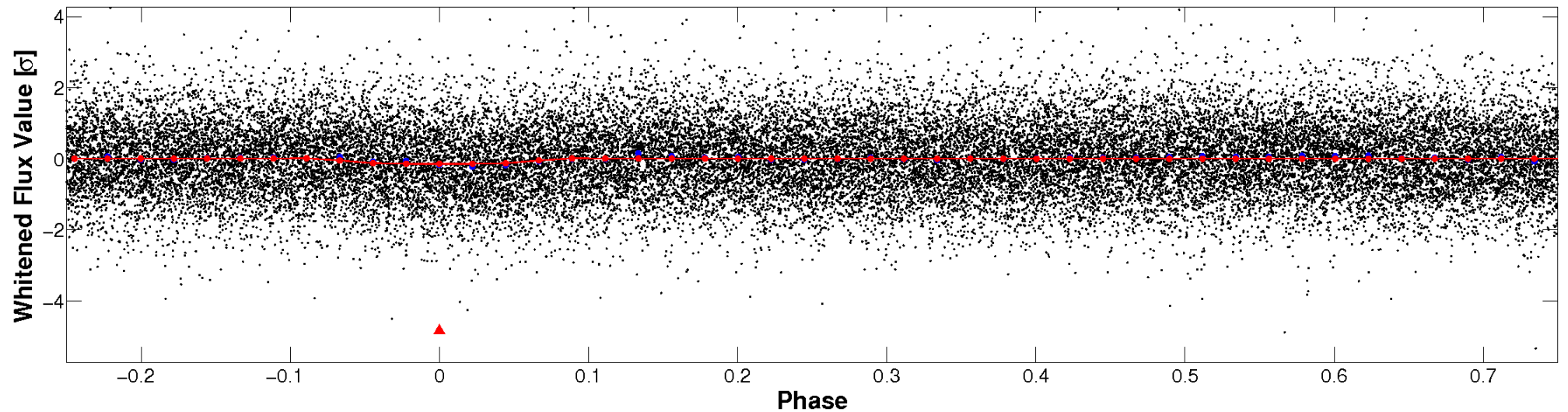


# Non-Whitened Vs. Whitened Light Curve

**Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

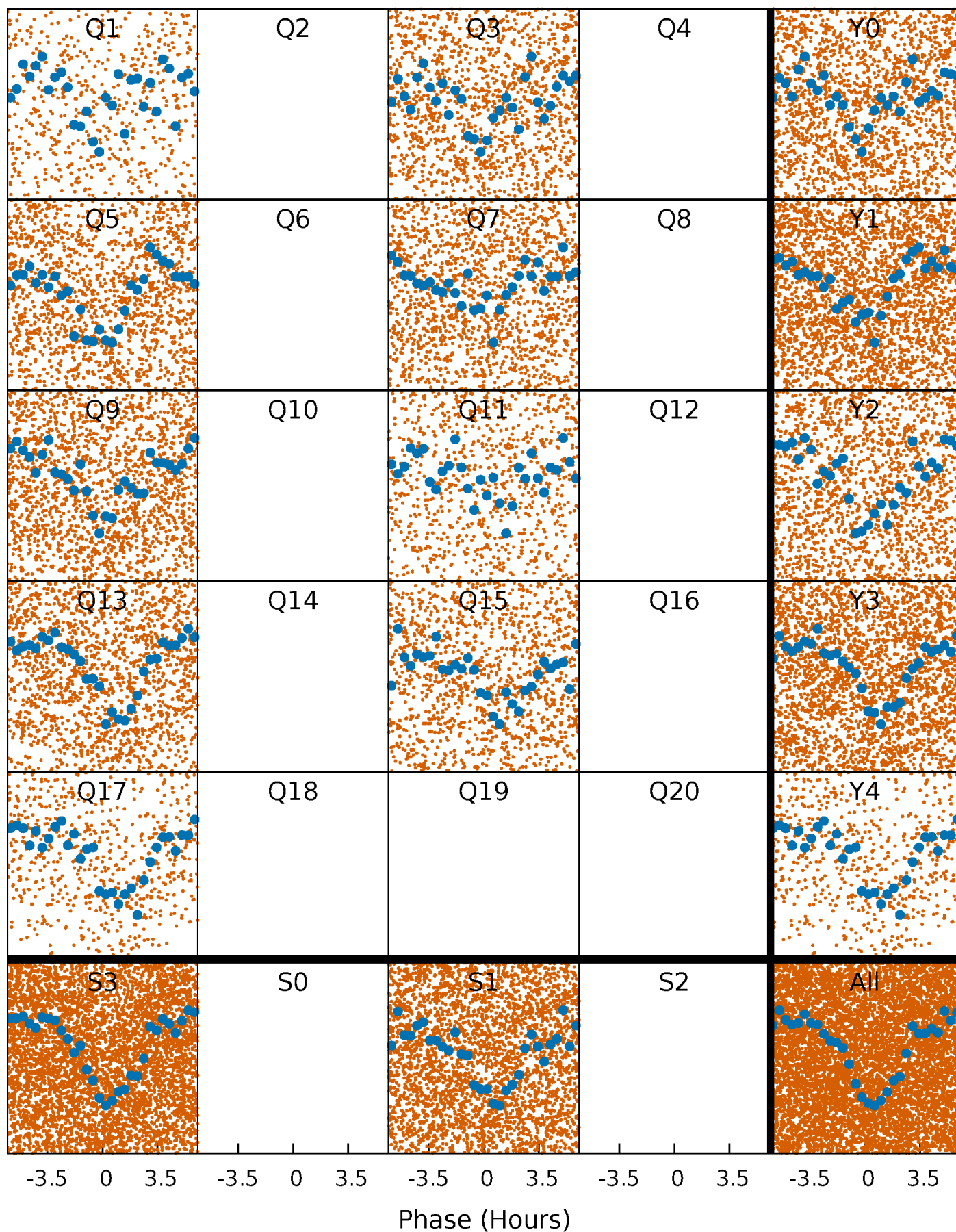


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

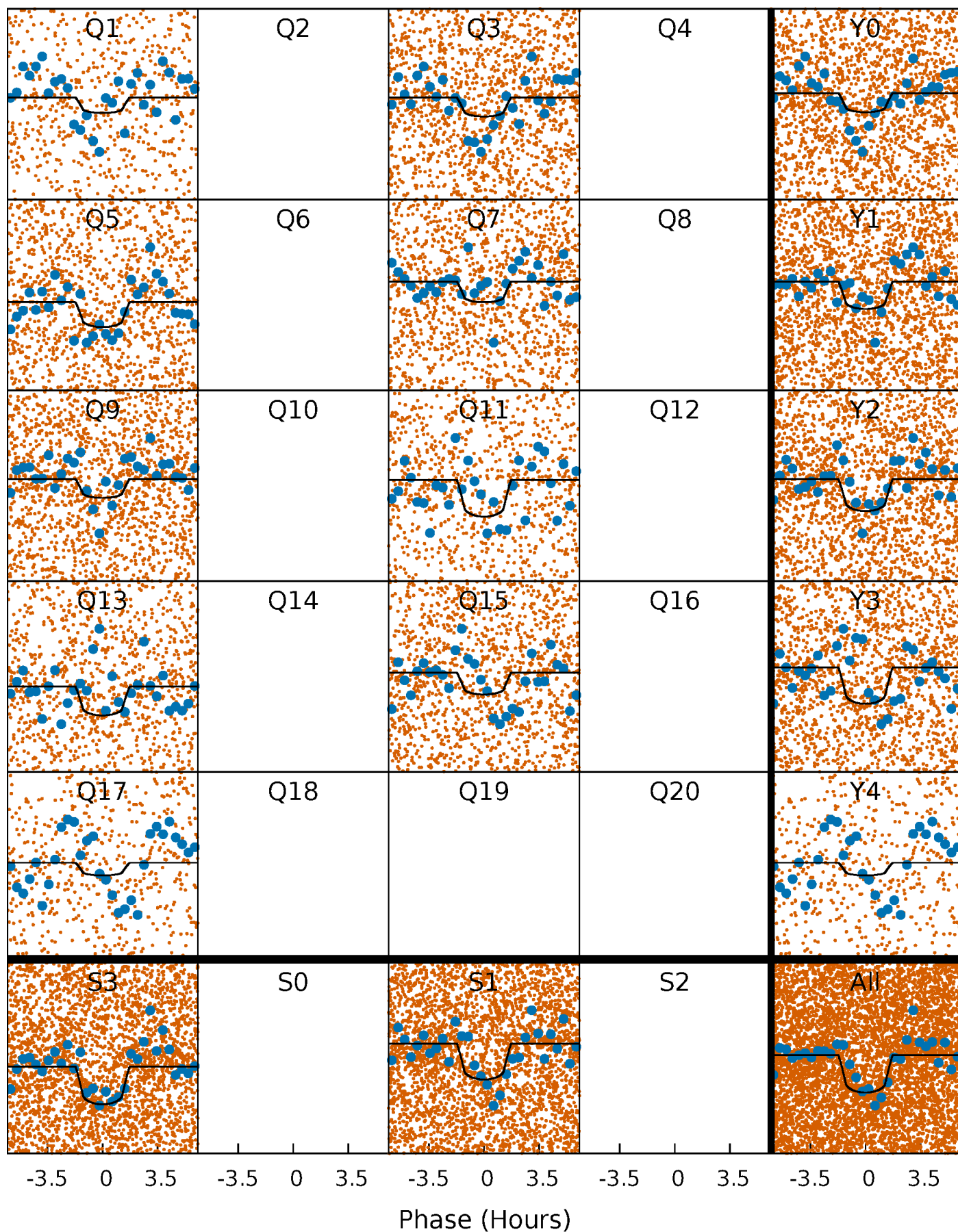
TCE 009083564-01 P= 0.918364 Days  $T_0=131.616666$  (BKJD)





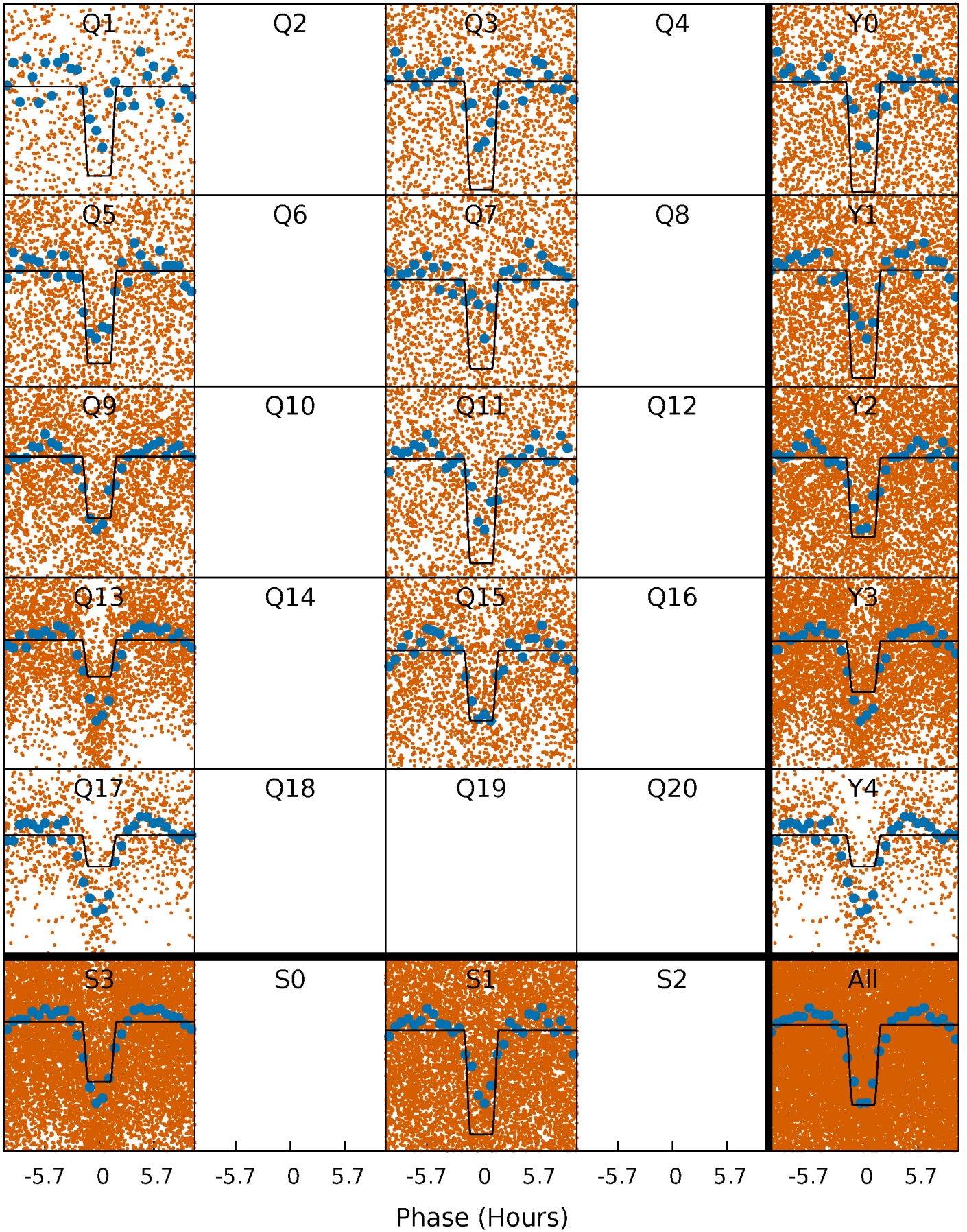
# DV Quarter-Phased Transit Curves

TCE 009083564-01   P= 0.918364 Days    $T_0=131.616666$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

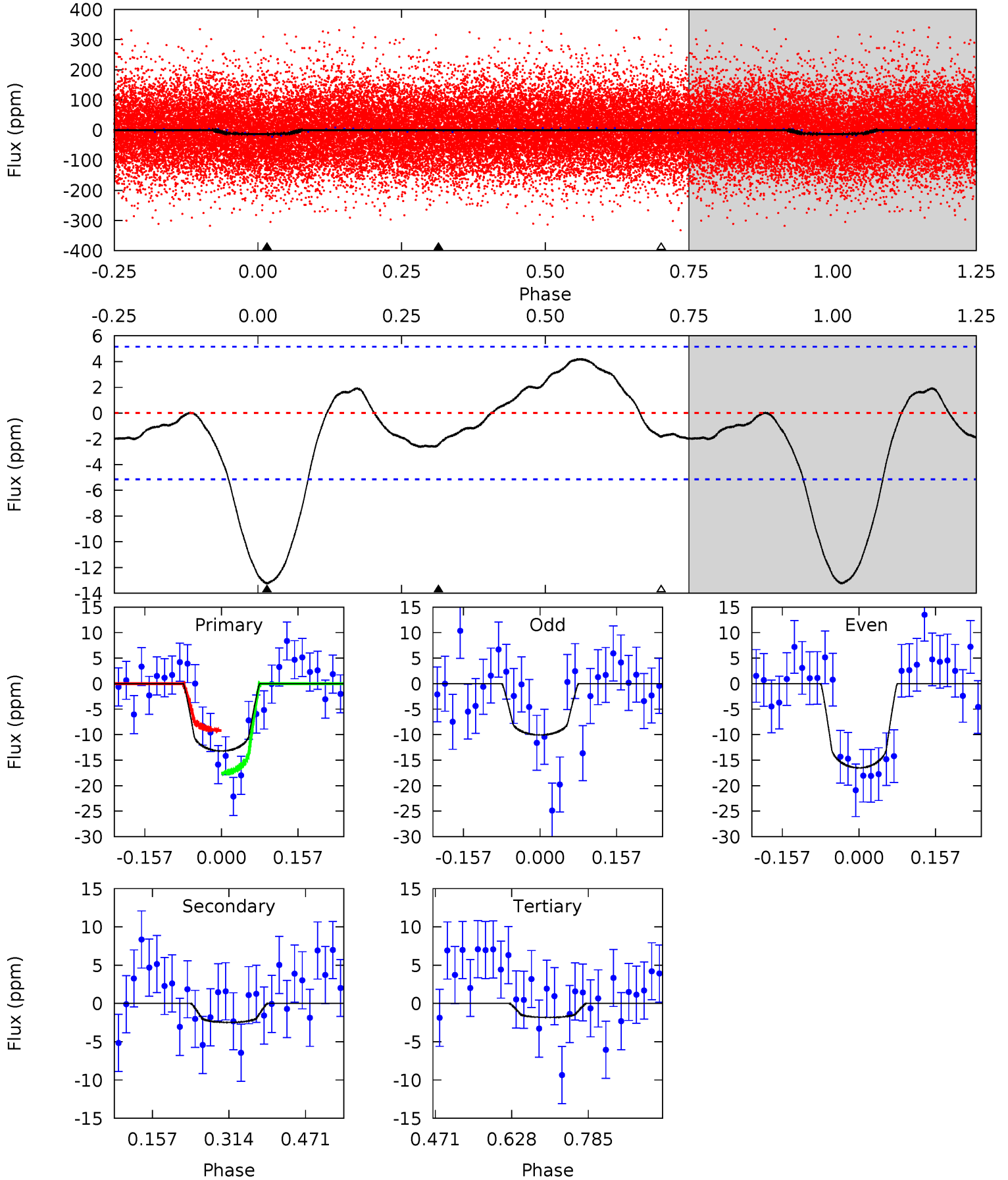
TCE 009083564-01 P= 0.918417 Days  $T_0=131.591768$  (BKJD)



# DV Model-Shift Uniqueness Test

009083564-01, P = 0.918364 Days, E = 130.698302 Days

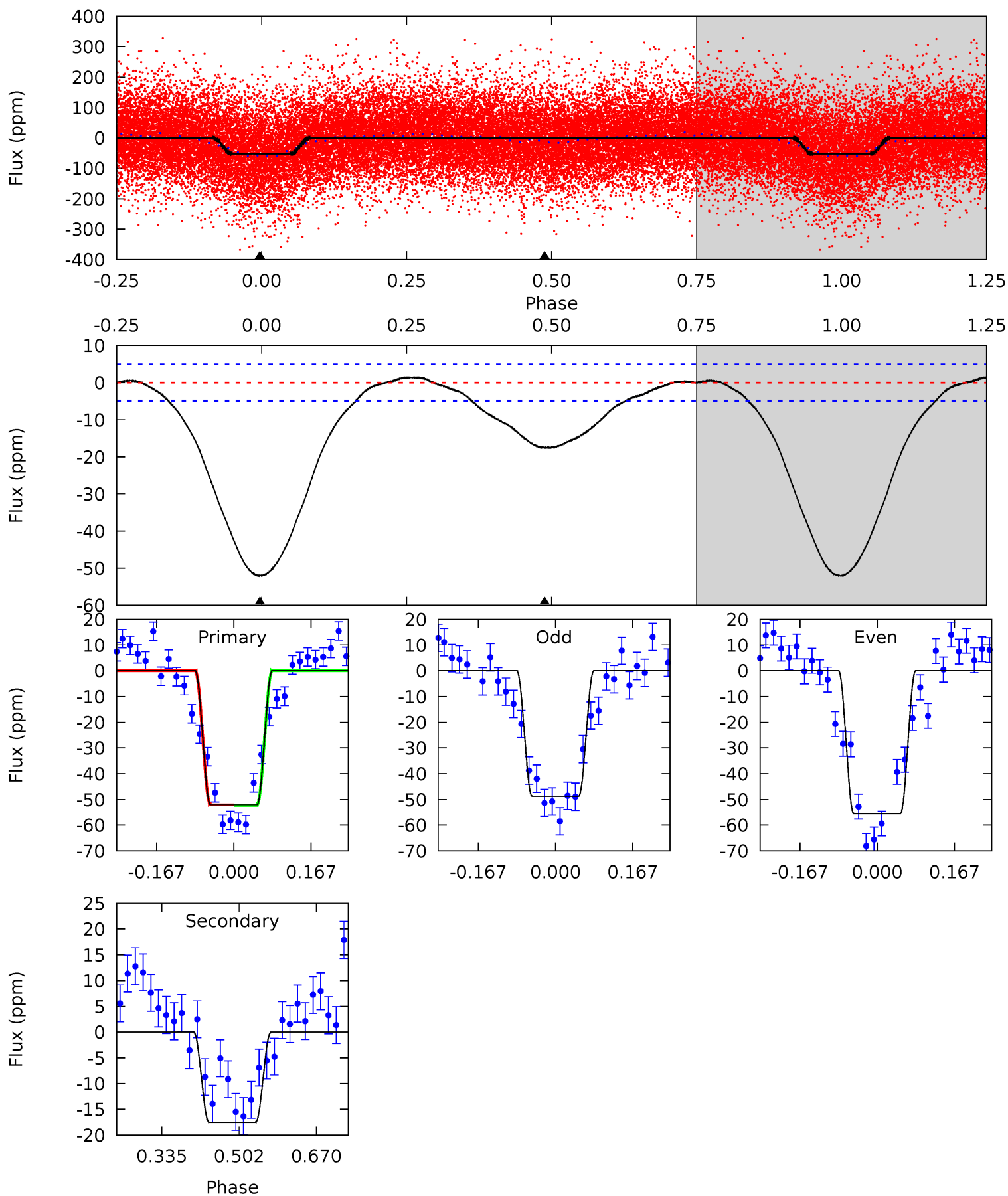
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	2.15	1.59	0	4.47	1.42	2.00	9.88	11.5	0.56	2.15	2.81	0.94	0.24	3.65



# Alt Model-Shift Uniqueness Test

009083564-01, P = 0.918417 Days, E = 130.673351 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.1	15.8	0	0	4.46	1.38	1.20	47.1	47.1	15.8	15.8	3.06	1.02	0.03	0.08



### Stellar Parameters For KIC 009083564

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6210^{+199}_{-243}$	$4.166^{+0.192}_{-0.128}$	$-0.120^{+0.300}_{-0.300}$	$1.434^{+0.326}_{-0.326}$	$1.098^{+0.164}_{-0.148}$	$0.525^{+0.551}_{-0.197}$
	+3%/-4%	+5%/-3%	+250%/-250%	+23%/-23%	+15%/-13%	+105%/-38%
Source	KIC0	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 009083564-01 / KOI 3249.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2 \pm 1$	$0.62^{+0.25}_{-0.27}$	$3287^{+217}_{-234}$	$3943^{+1152}_{-829}$	$1.274^{+2.838}_{-0.779}$
Alt.	$-18 \pm 1$	$1.18^{+0.28}_{-0.28}$	$3268^{+212}_{-209}$	$4603^{+508}_{-409}$	$2.577^{+1.750}_{-0.891}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



## DV Centroid Data

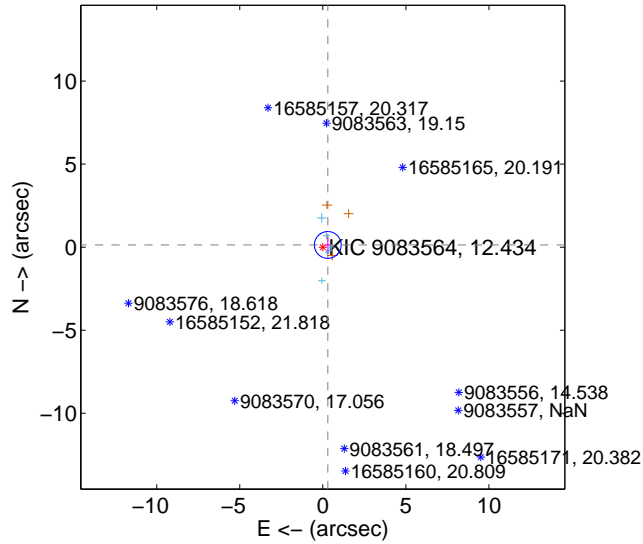
Supplemental centroid analysis for 009083564-01. Kepler magnitude: 12.43. Transit SNR 8.16

There are 6 quarters with good PRF difference image offsets

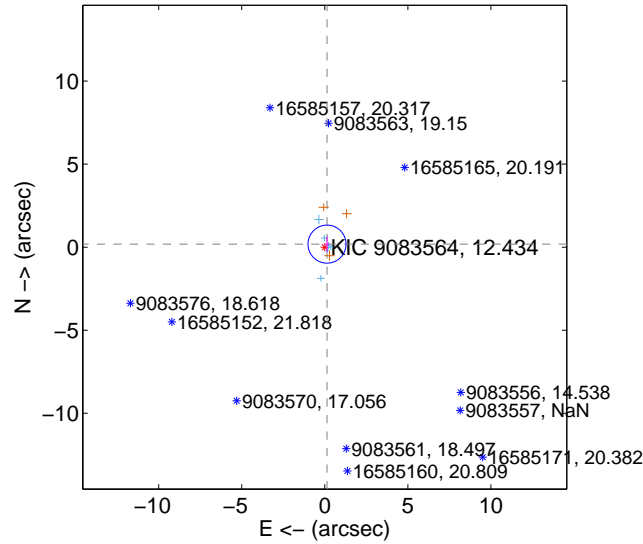
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.326 \pm 0.269$	1.21	$-0.298 \pm 0.170$	$0.133 \pm 0.462$
PRF-fit source offset from KIC position	$0.226 \pm 0.381$	0.59	$-0.133 \pm 0.132$	$0.183 \pm 0.461$
photometric centroid source offset	$7.47 \pm 1.56$	4.80	$-6.64 \pm 1.54$	$3.41 \pm 1.62$

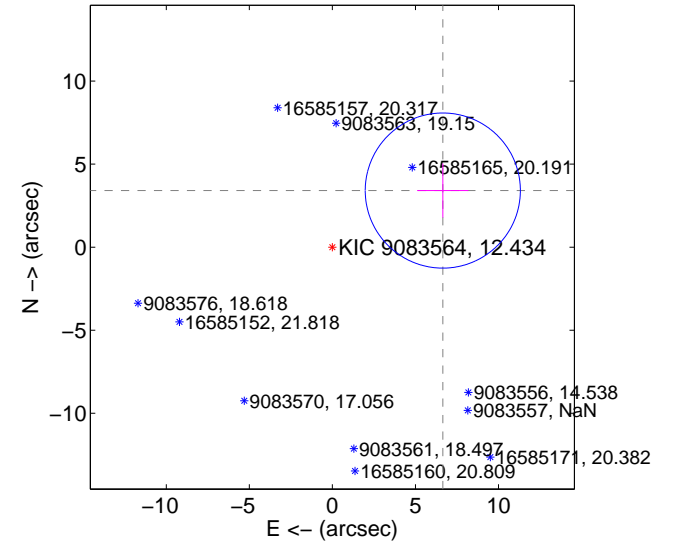
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

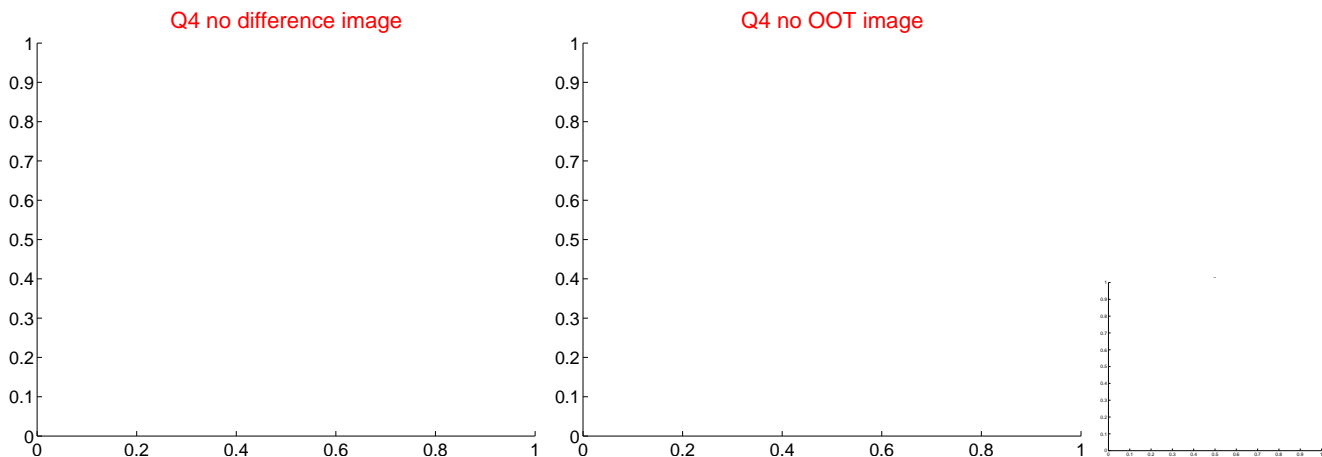
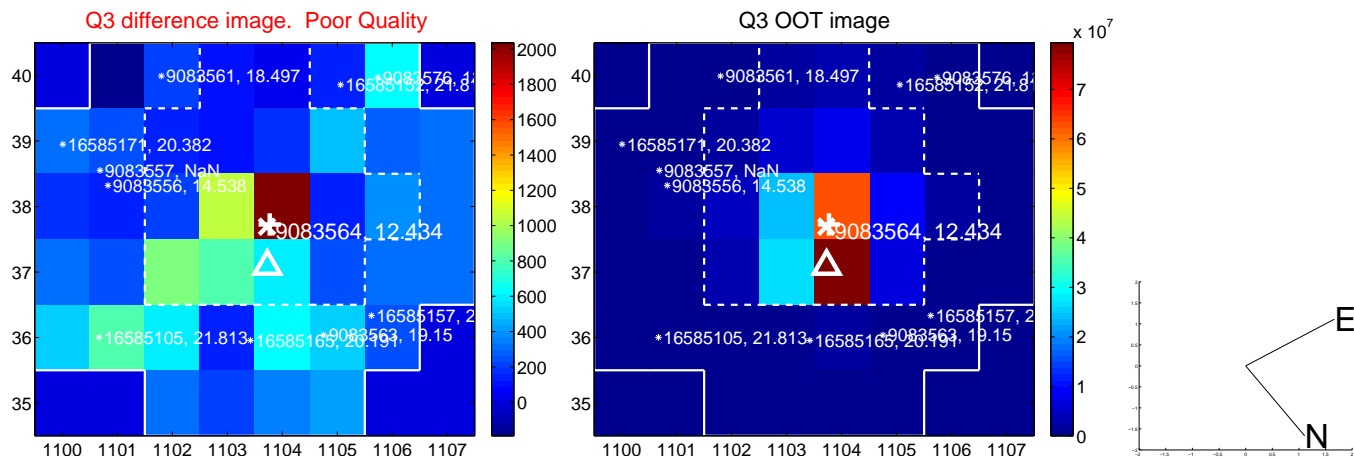
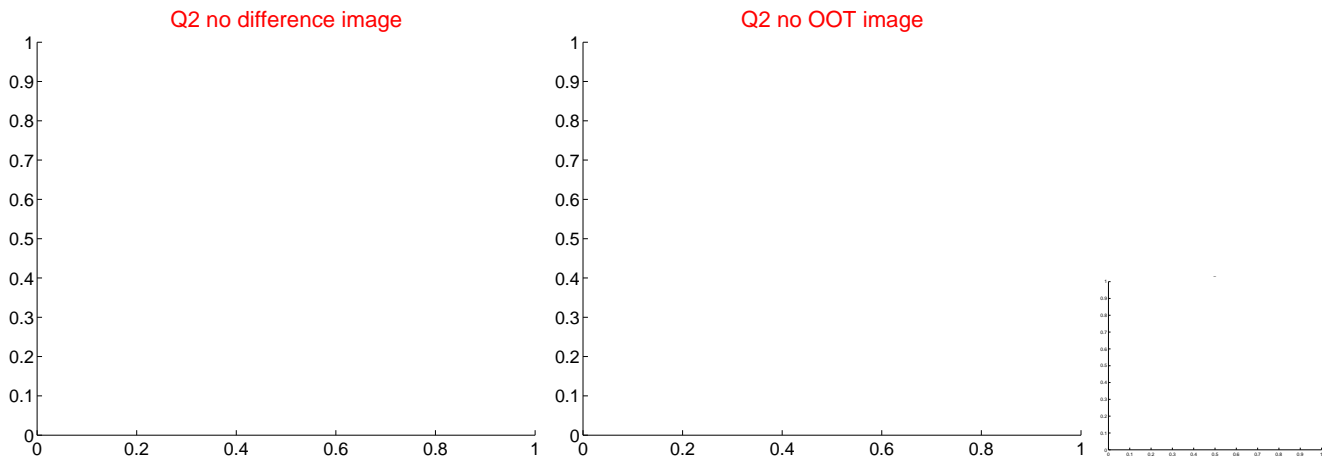
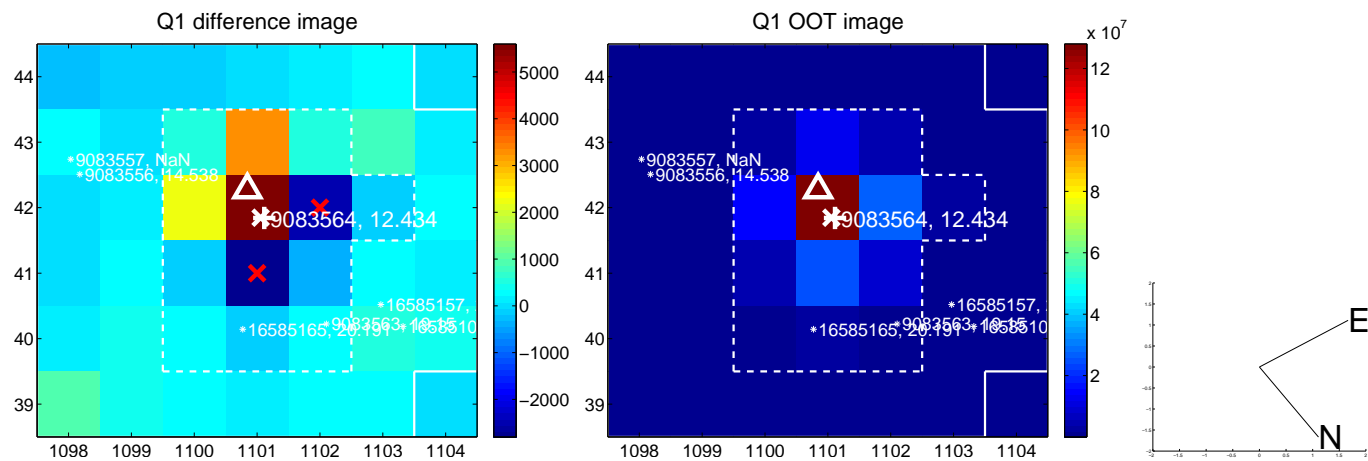


offset from photometric centroids

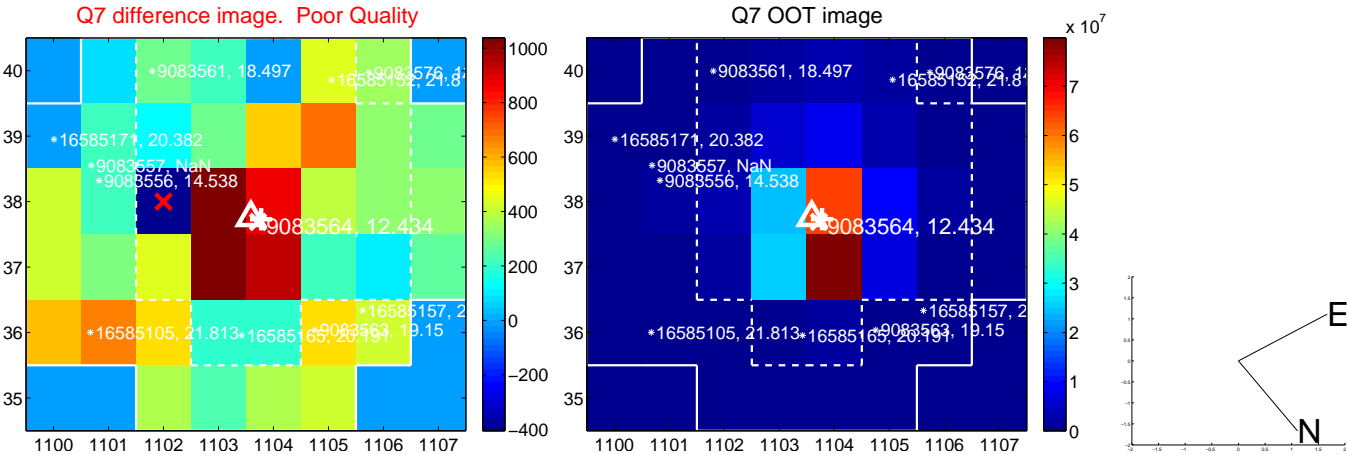
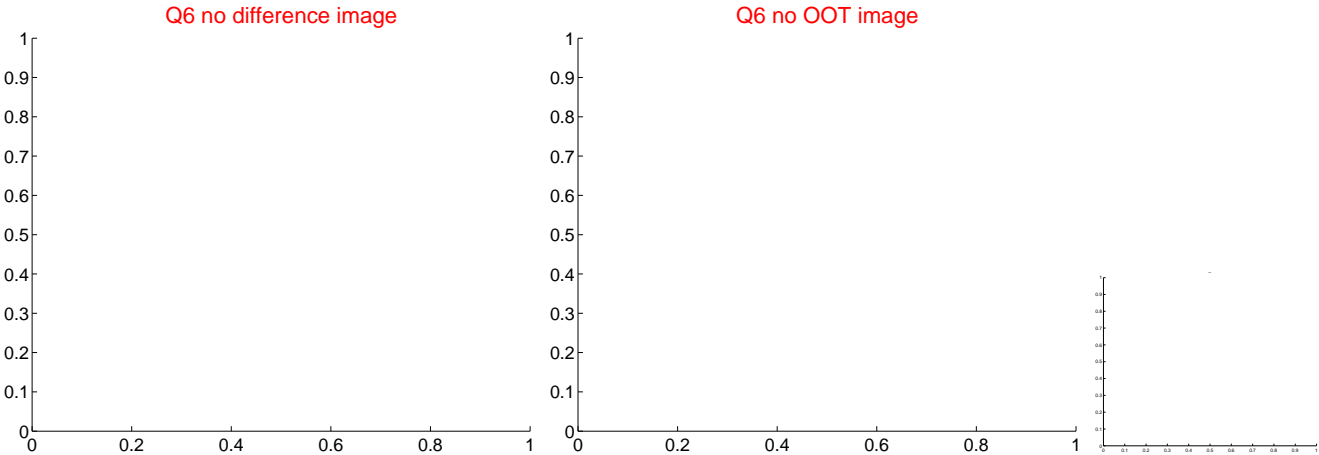
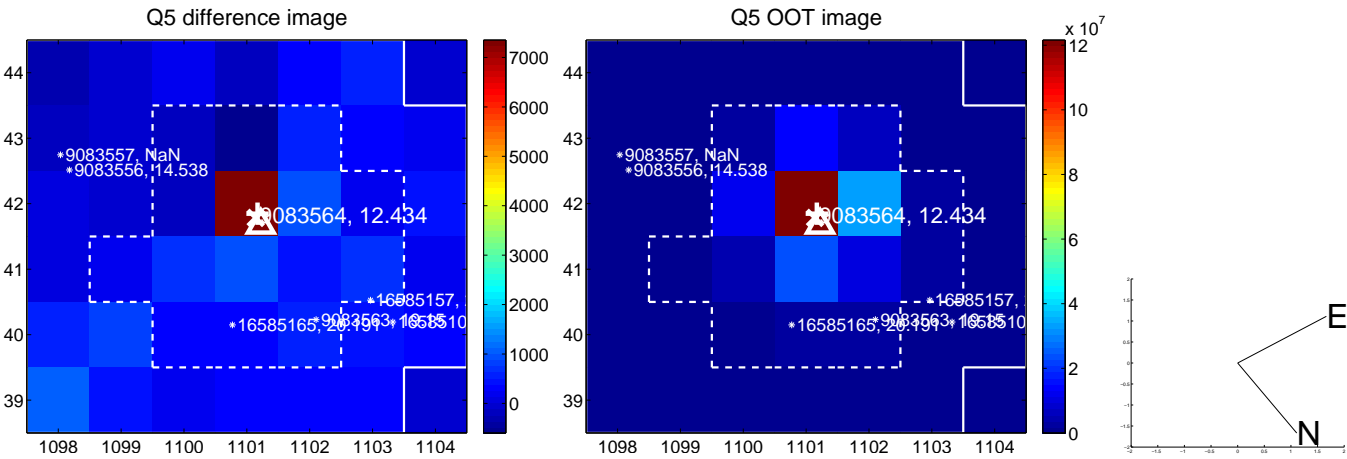


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

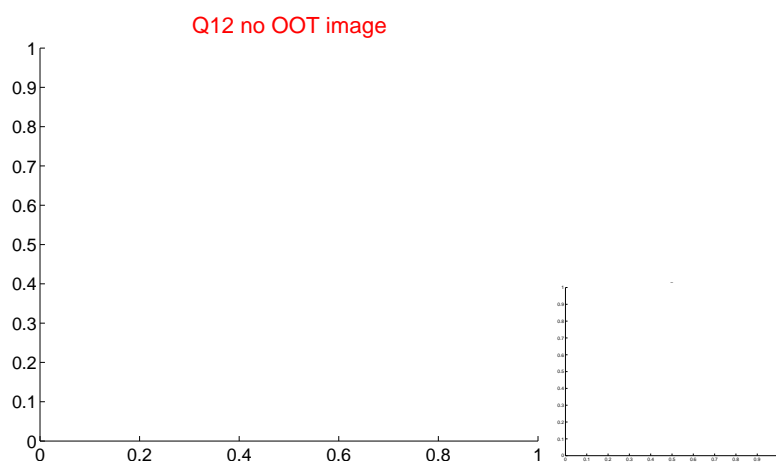
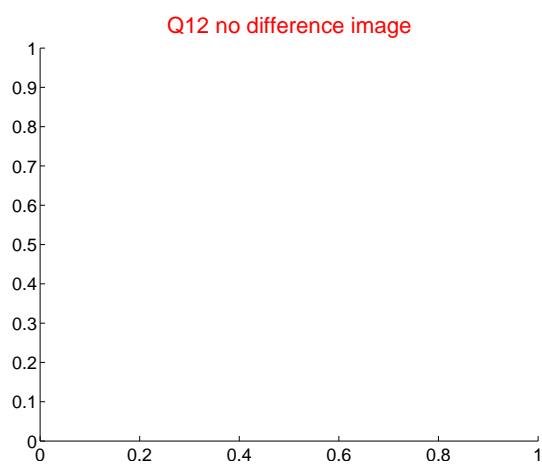
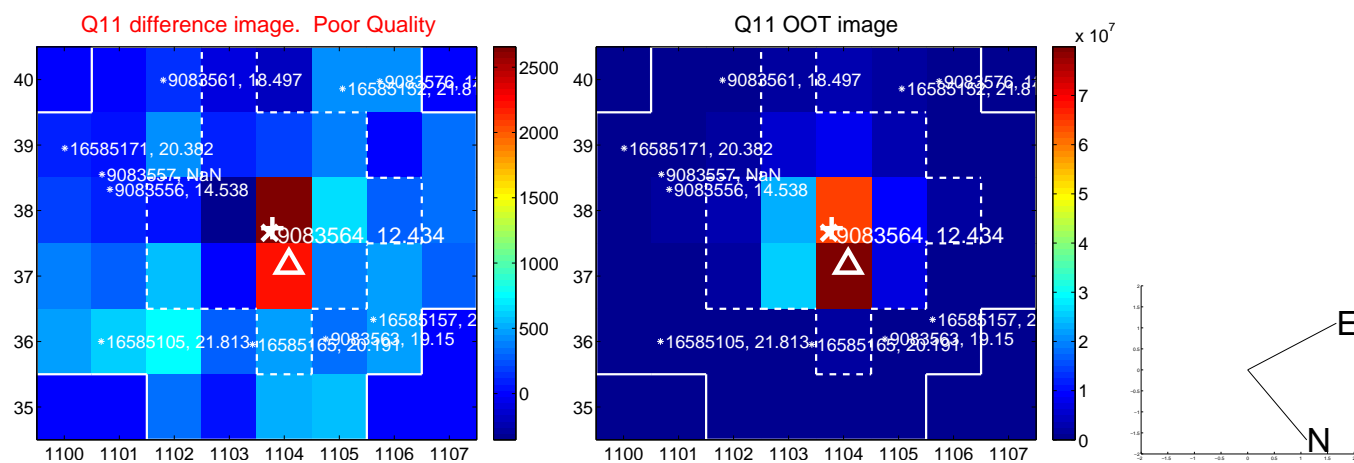
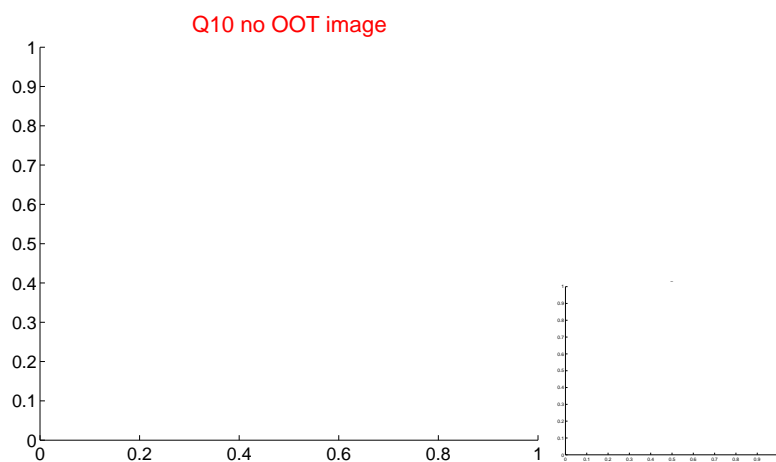
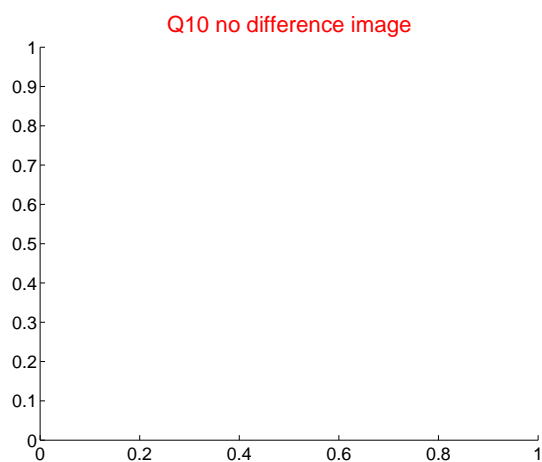
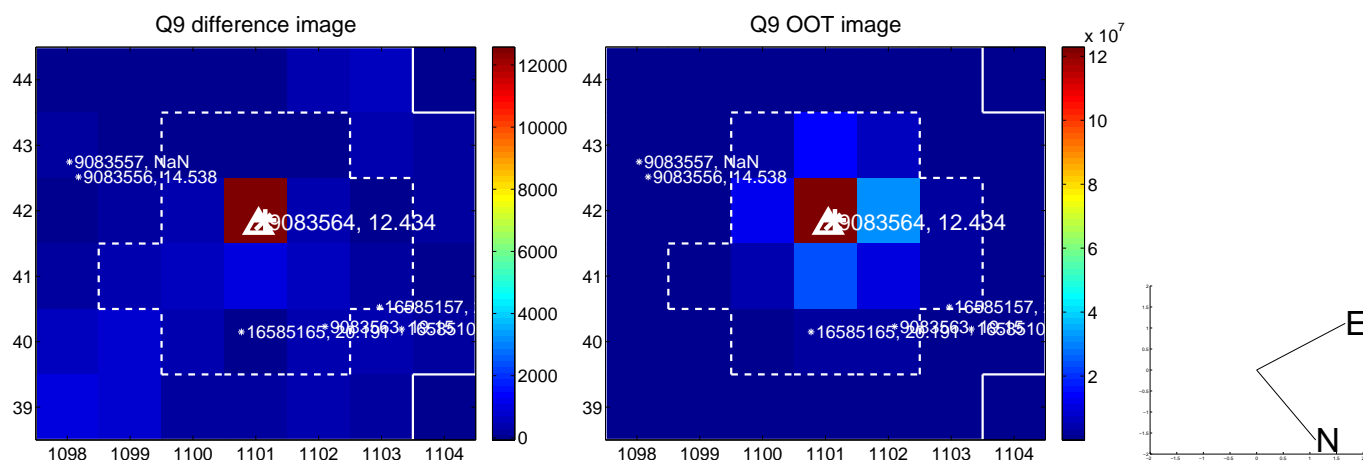
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



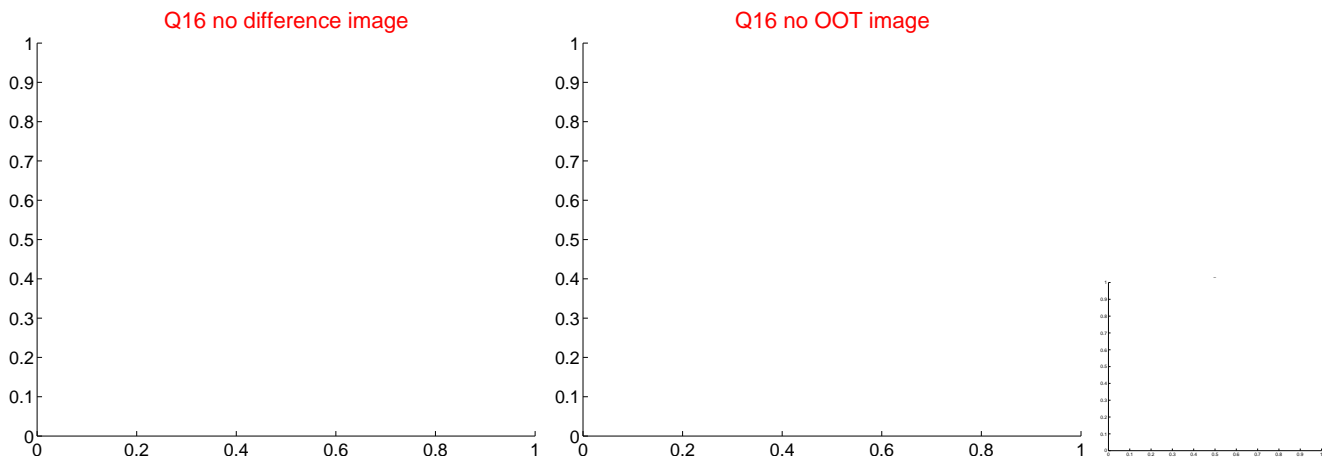
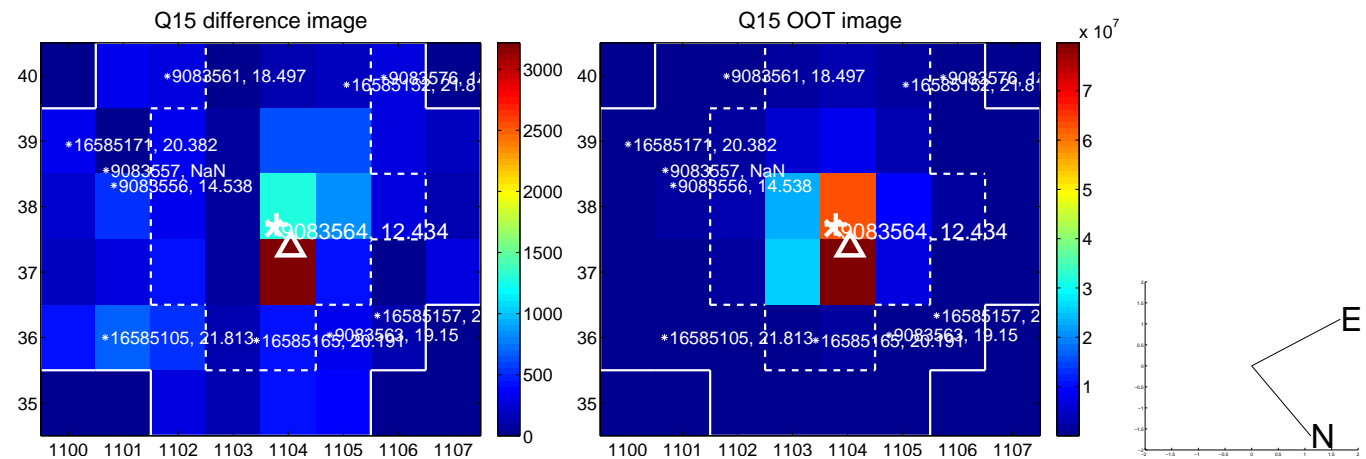
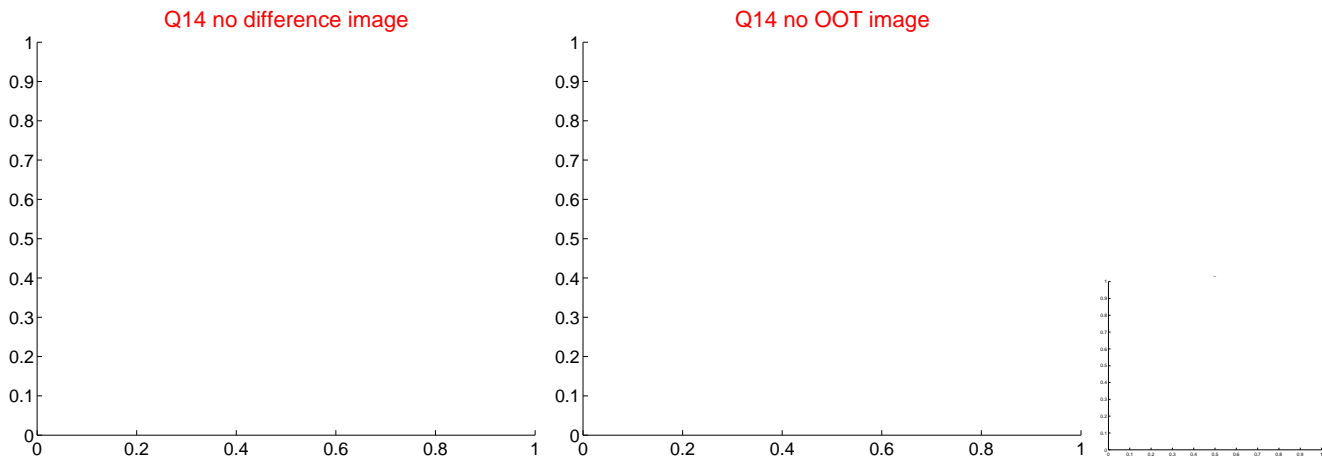
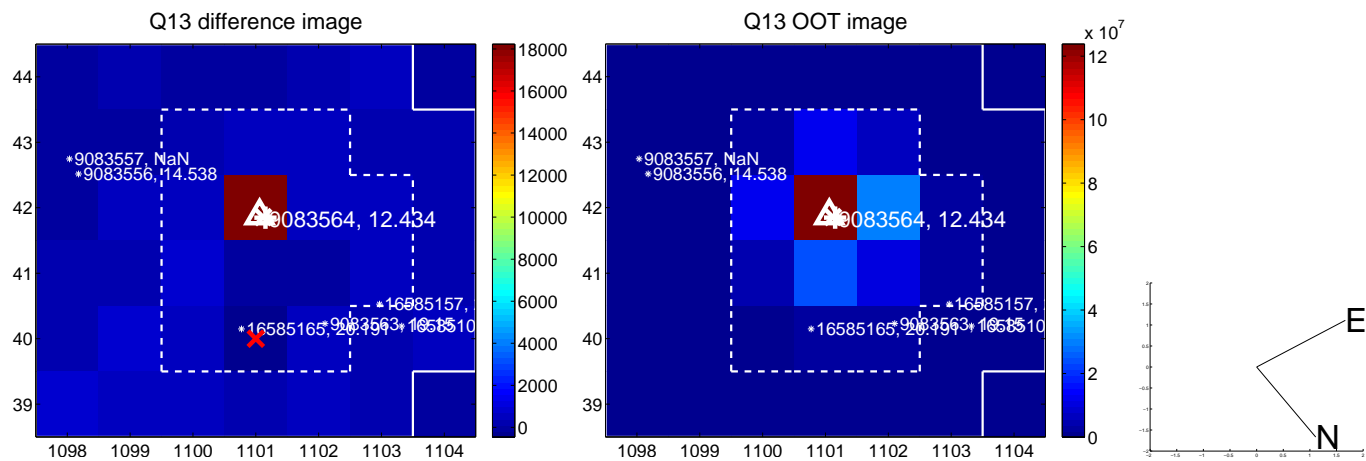
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

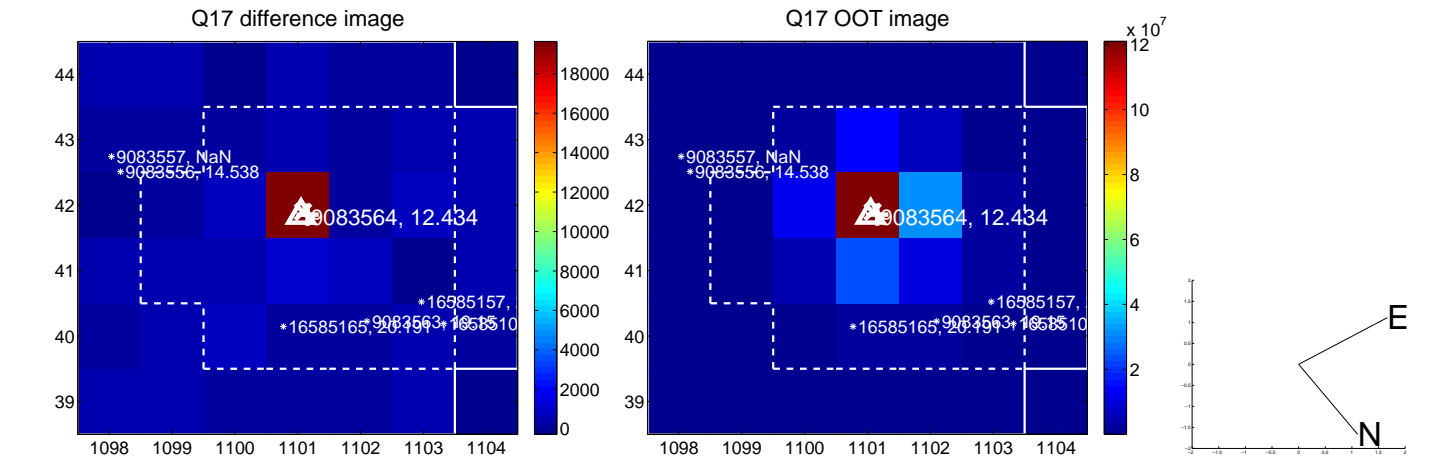


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

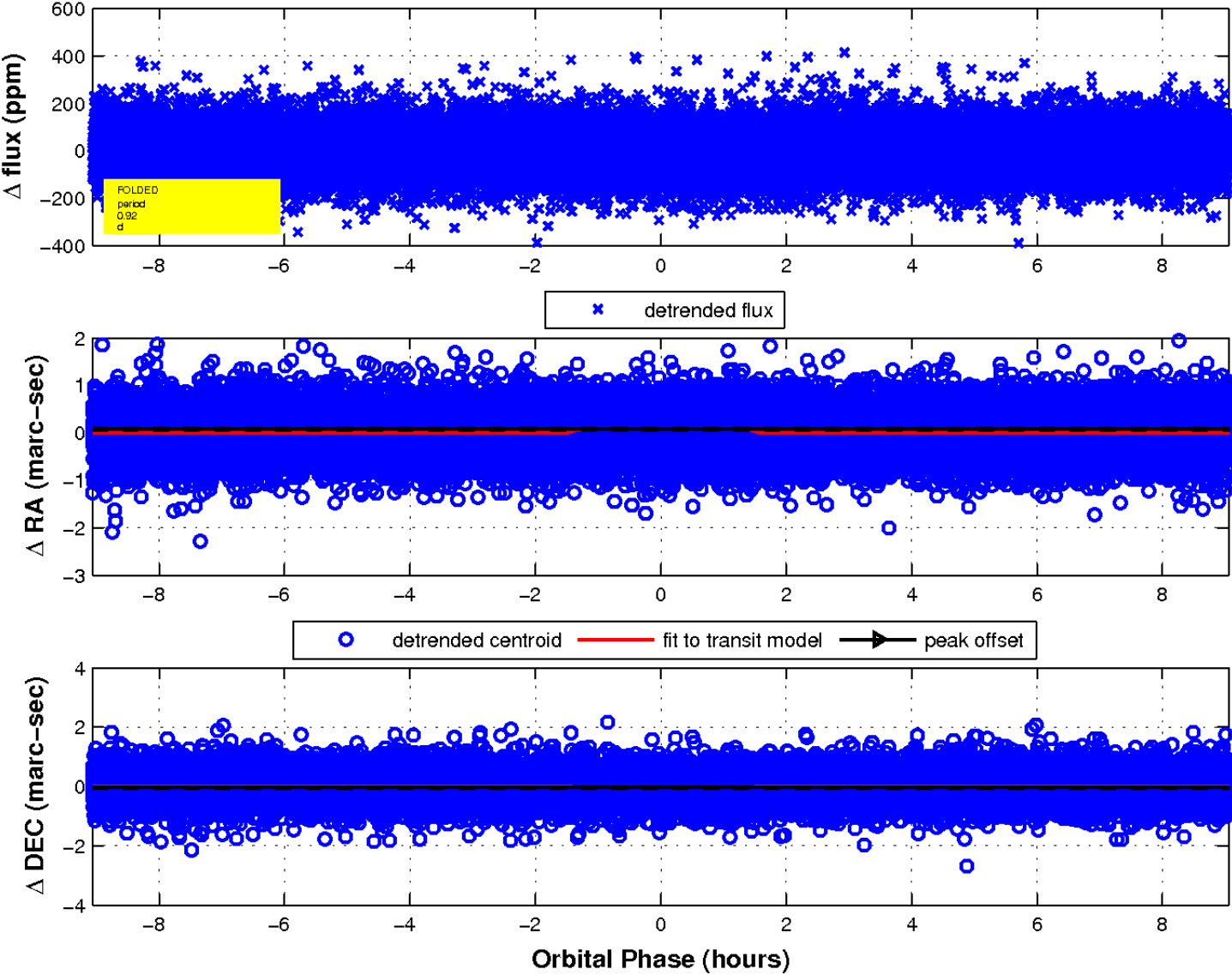




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

